

*1 hr.  
2 Puller threads*

# ECOLOGICAL MONOGRAPHS

OFFICIAL PUBLICATION OF THE  
ECOLOGICAL SOCIETY OF AMERICA

---

Volume 17, 1947

---

Published Quarterly by  
The Duke University Press  
Durham, N. C., U. S. A.

Q4  
540  
E17

# ECOLOGICAL MONOGRAPHS

A QUARTERLY JOURNAL  
FOR ALL PHASES OF BIOLOGY

EDITORS: BOTANY, C. F. KORSTIAN, Duke University, Durham, N. C.  
ZOOLOGY, A. S. PEARSE, Duke University, Durham, N. C.

BUSINESS MANAGER: EXIE DUNCAN, Duke University Press.

## MEMBERS OF THE EDITORIAL BOARD

1945-47

F. C. Gates, Kansas State College, Manhattan, Kansas.  
R. W. Pennak, University of Colorado, Boulder, Colorado.

1946-48

Samuel A. Graham, University of Michigan, Ann Arbor, Michigan.  
John W. Scott, University of Wyoming, Laramie, Wyoming.

1947-49

Hugh M. Raup, Arnold Arboretum, Jamaica Plain, Mass.  
Orlando Park, Northwestern University, Evanston, Illinois.

EX OFFICIO: Donald B. Lawrence, University of Minnesota.  
Thomas Park, University of Chicago.

The editorial board of this journal will consider ecological papers which are in general long enough to make twenty printed pages or more. Shorter ecological papers should be submitted to the editor of *Ecology*, which is also published by the Ecological Society of America. Both journals are open to ecological papers from all fields of biological science.

Manuscripts should be typewritten and may be sent to any member of the Editorial Board. Proof should be corrected immediately and returned to the Managing Editor at the address given above. Reprints should be ordered when proof is returned. Fifty copies, without covers, are supplied to authors free; covers and additional copies at cost. Correspondence concerning editorial matters should be sent to the Managing Editor; that concerning subscriptions, change of address, and back numbers to the Business Manager.

Subscription price, \$6.00 per year. Parts of volumes can be supplied at the rates for single numbers, \$1.50 each. Missing numbers will be supplied free when lost in the mails if written notice is received by the Business Manager within one month of date of issue. All remittances should be made payable to the Duke University Press.

Agents in Great Britain: The Cambridge University Press, Bentley House, 200 Euston Road, London, N.W. 1. Prices can be had on application.

Entered as Second-class Matter at the Postoffice at Durham, North Carolina

COPYRIGHT, 1947, BY DUKE UNIVERSITY PRESS

260

Nesti  
Ecolo  
Biolo  
A Ph  
Geolo  
Tertia  
Evide  
Distri  
Chara  
Evolut  
Develo  
Some  
A Com  
The M  
Sympo  
A. C  
Relatio  
Arid S  
An Eco  
with  
Respon  
in S  
Migratio

TABLE OF CONTENTS

Volume 17, 1947

NUMBER 1, JANUARY

	PAGE
Nesting and Production of the Ring-necked Pheasant in North-Central Iowa.....	Thomas S. Baskett 1
Ecology of the Sponges of a Brackish Water Environment at Beaufort, North Carolina.....	M. W. de Laubenfels 31
Biology of Isopoda of Michigan.....	Stephen P. Hatchett 47
A Phenological Record of Sauk and Dane Counties, Wisconsin, 1935-1945.....	Aldo Leopold and Sara Elizabeth Jones 81

NUMBER 2, APRIL

Geology and Plant Distribution.....	Theodor Just 127
Tertiary Centers and Migration Routes.....	Ralph W. Chaney 139
Evidence on Rates of Evolution from the Distribution of Existing and Fossil Plant Species.....	G. Ledyard Stebbins, Jr. 149
Distribution Patterns in Modern Plants and the Problems of Ancient Dispersals.....	W. H. Camp 159
Characteristics of Natural Areas and Factors in Their Development.....	Stanley A. Cain 185
Evolution of Certain Floristic Associations in Western North America.....	Herbert L. Mason 201
Development of the Deciduous Forests of Eastern North America.....	E. Lucy Braun 211
Some Natural Floristic Areas in Boreal America.....	Hugh M. Raup 221

NUMBER 3, JULY

A Comparison of Biotic Communities of the Cedar-Hemlock and Oak-Hickory Associations.....	Jane C. Dirks-Edmunds 235
The Marine Communities of a Tidal Inlet at Cape Ann, Massachusetts.....	Ralph W. Dexter 261
Symposium on Marine Ecology.....	
A. C. Redfield, G. E. Hutchinson, B. H. Ketchum, W. C. Herrington, L. W. Hutchins, and T. C. Nelson.....	295
Relation between the Moon and Periodicity in the Breeding of Marine Animals.....	P. Korrington 347

NUMBER 4, OCTOBER

Arid Southeast Oahu Vegetation, Hawaii.....	Frank E. Egler 383
An Ecological Life-History of Spirodela Polyrrhiza (Greater Duckweed).....	
with Emphasis on the Turion Phase.....	Don L. Jacobs 437
Response of Certain Legumes to Variations in Soil and Microclimate on Eroded Areas.....	
in Southeastern Iowa.....	Howard E. Brewer 471
Migration of Red-breasted Nuthatches in Gaspé.....	Stanley C. Ball 501